

harman/kardon®
Designed to Entertain.™



Harman Kardon Technologies
insight



FM Mode Sleep DSP Mode Mute

**A Guide to
Harman Kardon®
Technologies**

Virtually alone among today's most-respected audio brands, Harman Kardon® can point to a history of innovation stretching back more than 55 years, across dozens of landmark products and technologies, to the earliest days of high fidelity. The downside for Harman Kardon sales associates? All that history adds up to a lot to keep

in mind when interacting with customers on the sales floor.

Think of this guide as a short course for learning about the Harman Kardon brand – its products, its philosophy, and the many benefits its technologies offer to listeners who are passionate about audio.

We hope you'll find it useful on a daily basis.

Design Philosophy

Surround Formats

Audio and Video Formats

Content Aggregation

iPod Compatibility

Multiroom Functionalities

Stereo Features

Video Technologies

Ease of Use

Industrial Design

Since 1953, Harman Kardon designers and engineers have focused on improving home entertainment by combining extraordinary industrial design, innovative technologies, meticulous engineering and the highest levels of manufacturing quality in the brand's products. Extensive experience and research has put the brand in the unique position of being able to bring together the best in analog

and digital technologies, trend-setting design and flexible user interfaces to create high-performance, market-leading home entertainment systems. In fact, most of the technologies currently associated with today's very best amplifiers were originally introduced in Harman Kardon products. The newest Harman Kardon products retain the time-honored performance characteristics – high-current capability, ultrawide-bandwidth design and discrete circuitry, for example – that have built the brand, while incorporating and advancing the very latest audio and video technologies and formats.



Checklist of major Harman Kardon Milestones



- 1954** Festival D 1000. The world's first high-fidelity receiver.
- 1958** Festival TA230. The world's first stereo receiver.
- 1959** Citation II. The world's first ultrawide bandwidth amplifier.
- 1970** CAD5. The world's first cassette deck with Dolby® B-type noise reduction.
- 1980** Citation XX. The world's first high-current-capability amplifier.
- 2000** AVR 7000. The first A/V receiver with Logic 7,[®] VMAx[®] and HDCD[®] processing.
- 2001** EzSet/EQ.[™] Sound calibration technology.
- 2009** AVR 760. The world's first implementation of Dolby Volume technology.



Select

» ... [the true leader] knows that there is more knowledge and **insight** available from the group than he or any one person alone can bring to it.

Dr. Sidney Harman | Founder and Chairman Emeritus, Harman International

High-Current Capability

There's no use trying to hide it: Harman Kardon engineers have always been driven by a lust for power (or more accurately, current). Power (as measured in watts per channel) is an almost meaningless predictor of an amplifier's ability to drive loudspeakers. It's current (measured in amperes) that actually creates the audio signal that loudspeakers respond to – and the higher the current rating, the better the sound quality, at any volume level. Harman Kardon amplifiers have always delivered current ratings with more than enough headroom to drive the most demanding loudspeakers during even the most dynamic musical passages and movie soundtracks. And unlike many in the industry, we've always published our power ratings with all channels driven, in strict accordance with U.S. Federal Trade Commission guidelines. That means our performance figures are honest numbers, free of exaggeration, inflation or puffery. By delivering full-rated power to all channels simultaneously, Harman Kardon products reproduce music and movies the way they were intended to be heard.

	Harman Kardon AVR 255	Brand X	Brand Y	Brand Z
Manufacturer's rating				
All channels driven, 8 ohms, 20Hz-20kHz, THD 0.07%	50W	N/A	N/A	N/A
One channel driven, 6 ohms, 1kHz, THD 0.10%	N/A	140W	110W	120W
Independent measurement				
One channel driven, 8 ohms, 1kHz, THD 0.10%	62W	26W	53W	33W
Number of channels	7	7	7	7
CEA 2019* rating	434W	182W	371W	231W

* CEA 2019 New testing and measurement method for audio amplifiers. Total system power (W) = number of channels x power per channel.

Benefit

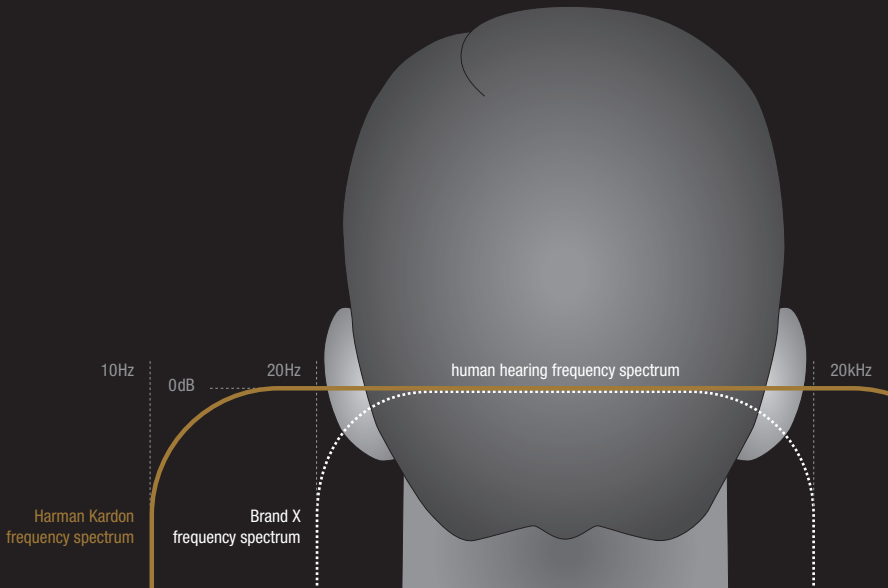
Tighter bass and superb transient response, at any volume level.

Both deliver 12V,
but which one would you
choose to start your car?



Low Negative Feedback

All amplifiers use negative feedback to reduce harmonic distortion. But high levels of negative feedback can have a harsh, grating effect on overall sound quality. By using only the highest quality transistors, passive components and construction techniques, Harman Kardon amplifiers limit negative feedback to less than 25dB compared with 60dB or more in some competitive products – for substantially lower distortion.



Benefit
Purer, more
realistic sound.

Benefit
Sharper sound
with more
precise imaging.

100kHz

Ultrawide-Frequency Bandwidth

While many amplifiers and receivers struggle to cleanly reproduce the audible frequency spectrum from 20Hz to 20kHz, **Harman Kardon** components typically perform to well beyond 100kHz. Although this exceeds the usual limits of human hearing, it reduces phase distortion for improved phase linearity and transient accuracy.

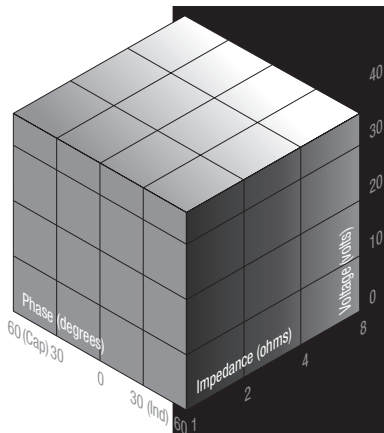
Discrete Circuitry

To the fullest extent possible, Harman Kardon products use separate transistors, resistors, capacitors and diodes in their circuitry, instead of integrated circuits (ICs), in which such components are bundled together on all-purpose silicon chips. Discrete circuits are almost always more expensive than ICs, but they almost always outperform them.

Is it any wonder that Harman Kardon engineers prefer them?

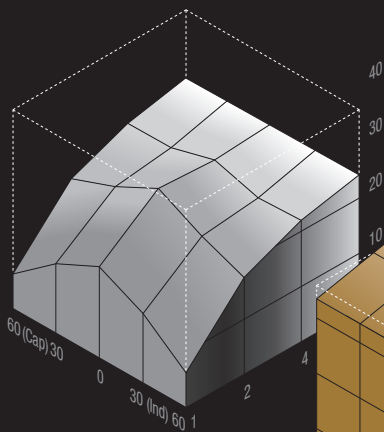
The Power Cube Measurement

In an ideal amplifier, output voltage remains constant, regardless of the current being drawn, or the phase angles of that current. This can be visualized in three dimensions, with “phase” as the horizontal axis, “impedance” as the depth axis and “power output” as the vertical axis. Groundbreaking Harman Kardon research has established the power cube measurement as the most accurate indication of amplifier quality, as correlated with the results of subjective listening tests. It also provides a useful visual aid for comparing the performance of Harman Kardon amplifiers to the performance of amps from other manufacturers.

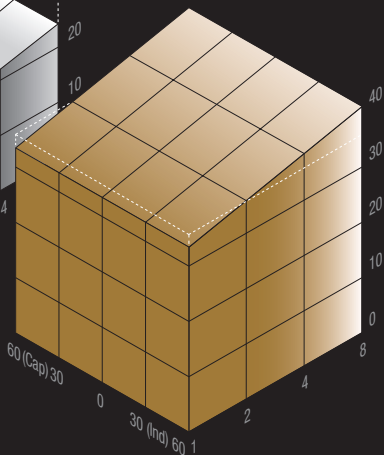


Ideal amplifier

Benefit
Minimal
noise
and signal
loss.



Competitive amplifier



Harman Kardon amplifier (HK 990)



- » Our products are an expression of customers' desire to command the "best seat in the house", no matter what kind of music or entertainment they enjoy.

Dinesh Paliwal | Chairman and CEO, Harman International





Surround Formats

HD

Surround

Audio



DOLBY
TRUEHD

dts-HD
Master Audio

Benefit
Future-proof
connectivity.

About DTS and Dolby

Throughout the years, landmark Harman Kardon products have led the transition from vacuum tubes to solid state, from mono to hi-fi, and from analog to digital, with features that have often broken new ground, and performance that has always set higher standards. In the fast-moving digital era, Harman Kardon

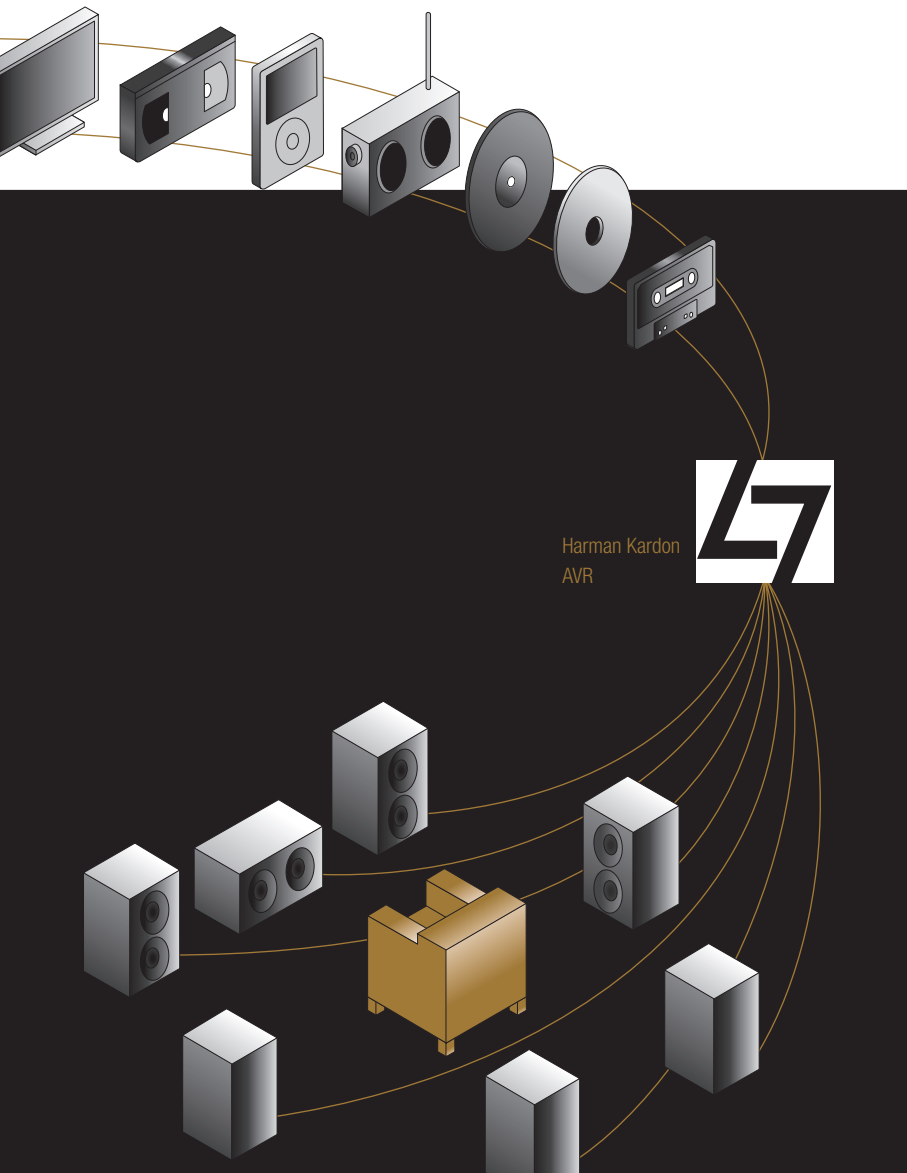
products have always supported the widest range of popular sound-processing technologies. Our newest A/V receivers, for example, feature two onboard 32-bit DSP processors to decode the full suite of Dolby and DTS® technologies, including Dolby TrueHD and DTS-HD™ Master Audio.

Dolby Volume Technology

Dolby Volume is a sophisticated new technology that resolves the problem of varying volume levels across both program content and program sources. Starting in select Harman Kardon A/V receivers, Dolby Volume technology enables listeners to enjoy all their content and programming at the same preferred listening level without having to reach for the remote control.



Benefit
A more
consistent,
comfortable
and enjoyable
listening
experience.



Benefit
Stunning
5- or 7-channel
surround sound
from compact
discs, LPs,
cassettes and
videotapes.

Logic 7 Technology

Harman Kardon Logic 7 sound processing uses proprietary digital algorithms to **create a more cohesive and enveloping sound field from analog matrix recordings**, including the tens of thousands of stereo titles still in widespread use. Logic 7 is not only capable of resolving either five or seven channels from a two-channel source, it actually increases the accuracy with which sounds are directed to the center and surround channels for more precise reproduction of the original soundtrack. Developed for high-end processors and now featured in a growing number of luxury automobiles, Logic 7 processing is built into every Harman Kardon A/V receiver.

HS 350

DISC DVD

TITLE

01

CHAP

06

harman/kardon

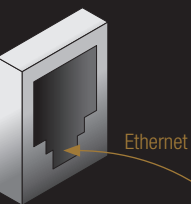
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Audio and Video Formats

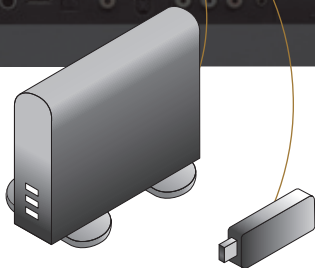
HRUR MIN YUV PASCAN HDMI SEC 720P
9:15:54

» While it's nice to enjoy something good, it's even better to experience something great.

Rich Sorota | President, Harman Consumer Division



Ethernet



**A Glossary of
Common Video
Formats**

**Connectivity,
Compatibility
and
Convergence**

MPEG-2

A widely used format for digital television signals and DVD and SVCD discs with a resolution limit of 720 pixels x 480 pixels.



A next-generation disc format developed to enable recording, rewriting and playback of high-definition video. A Blu-ray Disc™ offers up to 10 times the storage capacity of traditional DVDs, holding up to 25GB on a single-layer disc, and 50GB on a dual-layer disc.

MPEG-4

A series of codecs designed to standardize the production and distribution of digital content for HDTV and multimedia applications.



A video codec popular for its ability to highly compress digital video into small file sizes with relatively high visual quality.

The Harman Kardon brand was the first to link home entertainment systems to computer audio in a variety of popular formats, and its new receivers include the first models that allow you not just to listen to a USB memory device, but

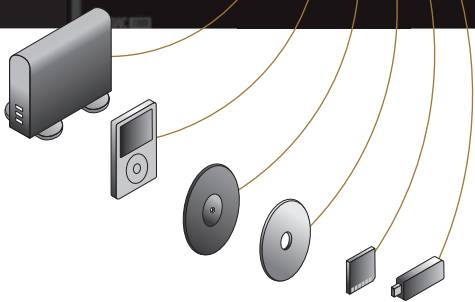
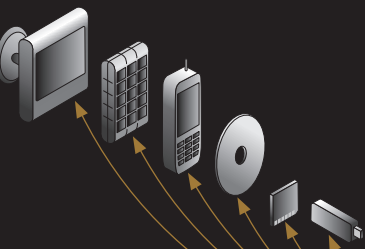
to actually control playback through your receiver's remote. Harman Kardon receivers also feature connections for a great number of video devices, all with the latest version of HDMI. Video recording outputs, preamp-out jacks for all channels and color-coded eight-channel inputs make Harman Kardon AVRs uniquely versatile.

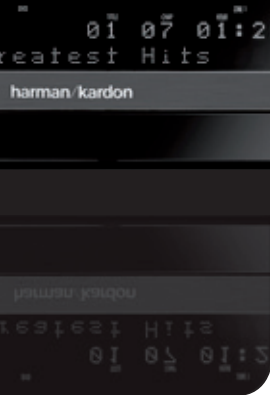




» I'd rather explain our prices
than compromise on quality.

Thijs Linthorst | General Manager, Harman Consumer International





Managing Digital Assets

Just as some digital devices are converging, digital sources continue to proliferate, and generations of analog sources steadfastly refuse to go away. Consumers may own entertainment in the form of CDs, vinyl records, DVDs, magnetic tape and memory cards of one sort or another – some neatly stored on computers and portable players, others simply scattered about in various attics, closets, drawers and glove boxes. Harman Kardon Digital Media Centers make it possible to aggregate much of this material onto a central hard disk, and to share it among otherwise incompatible digital devices.

» Harman Kardon products:
The materialization of unfettered design.

Kurt Solland | V.P. Industrial Design, Harman International



harman/kardon



iPod Compatibility

Building Bridges

The Apple iPod – and the countless portable music players that have come before and after it – has revolutionized how and where we listen to music. The Harman Kardon “The Bridge” was one of the first products designed to integrate the iPod into traditional home entertainment systems. The Bridge is a docking station for the iPod that connects directly to most Harman Kardon A/V receivers – controlled by the AVR remote with on-screen or front-panel menus that users can read from across the room.



Benefit
Choose or
change tracks
and playlists
without
interrupting
playback.

MENU
PLAYLISTS →

Audio Modes Surround Modes Back/Exit

harman/kardon



harman/kardon

harman/kardon

iPod Compatibility

Optical

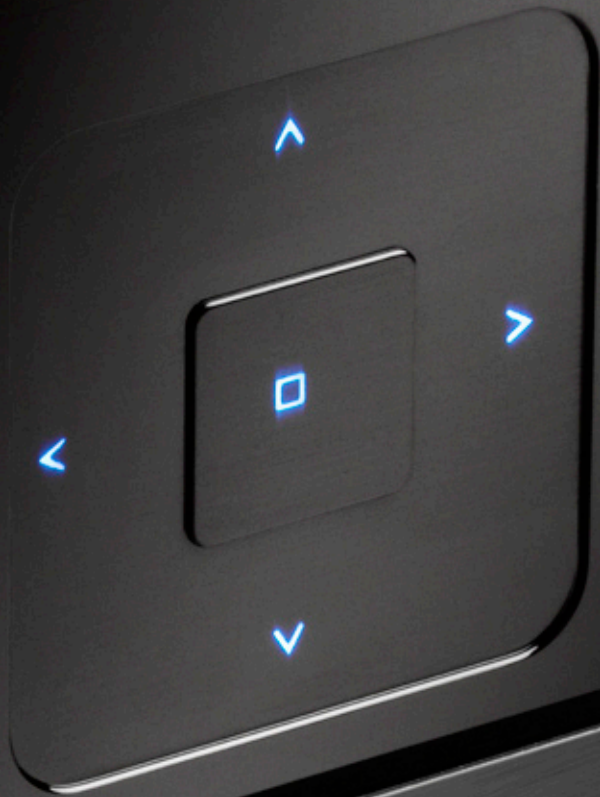


harman

» There are always
more rooms to improve.

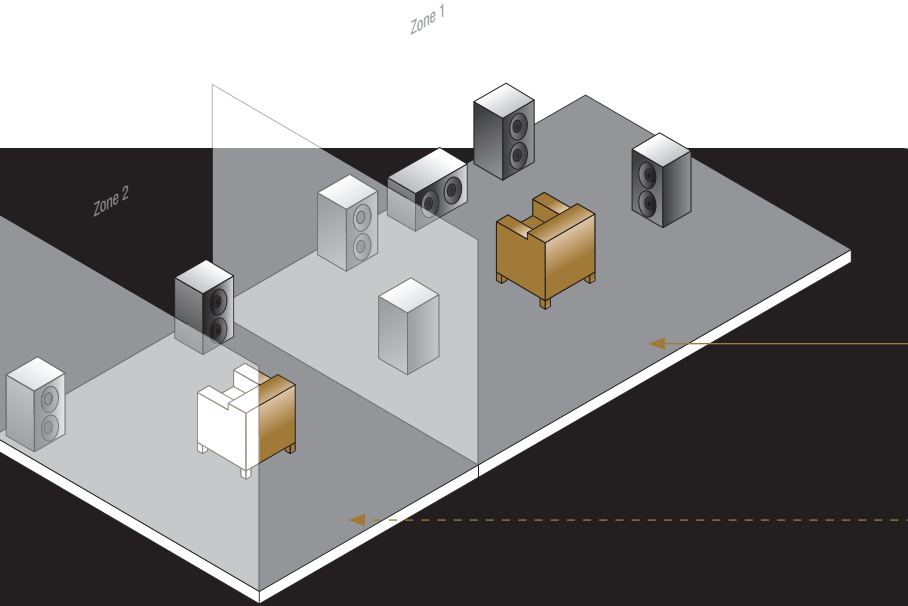
Carsten Olesen | Commercial Director, Harman Consumer International

lan / kardon



Multiroom Functionalities

Benefit
Multiroom
solutions
are built
in, not
added on.

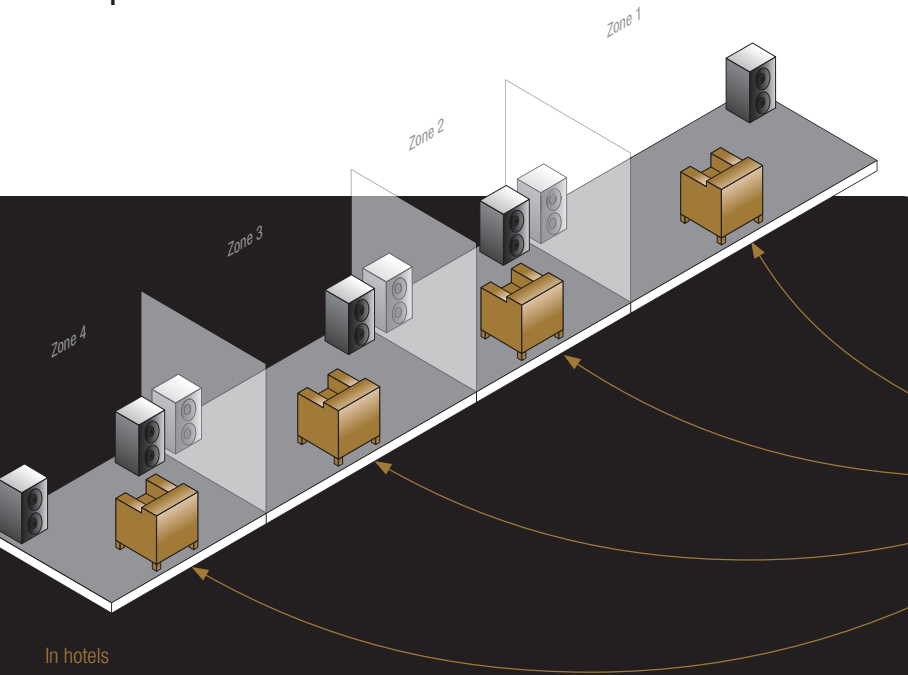


Entertainment Systems That Multitask

Harman Kardon products offer a choice of ways to easily create multiroom entertainment systems. All Harman Kardon 7.1-channel A/V receivers are built with assignable rear-channel amplifiers and a second-zone control system, and many include a second-zone remote. The DMC digital media center is designed to distribute separate audio streams from a central music library to up to four different locations in a home, allowing users to spread out and enjoy themselves – their entertainment will be there for them.



Benefit
Centralized
access to
your entire
music library
without a
computer.

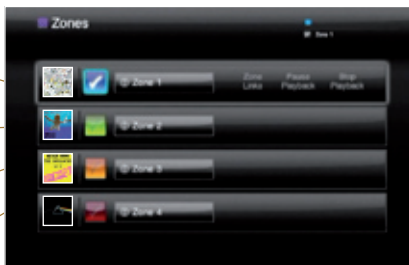


In hotels
In shops
At home

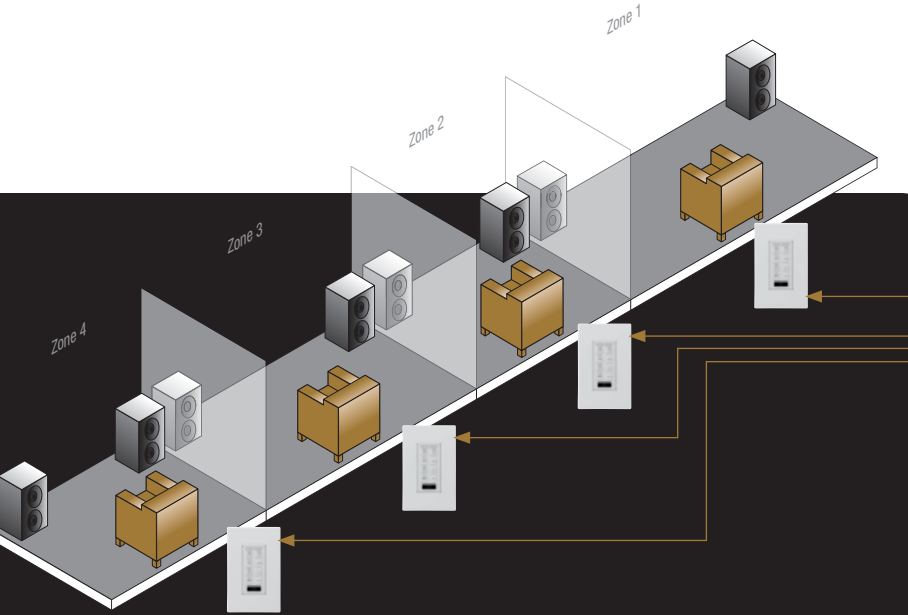
Digital Media Centers

With the Digital Media Center, the idea of a central media server that works like an entertainment device, not a computer peripheral, has become a reality. Fluent in a universe of digital-storage technologies and formats,

a Harman Kardon Digital Media Center is the one go-to device to finally bridge the DVD/CD/music system/cell phone/camera divide. One of the Media Center's most exciting features is its capability of recording audio from a CD or an external analog audio source, converting it to the MP3 format and storing it on the built-in HDD. Once stored, the Media Center allows distribution of separate audio streams from the music library to up to four different locations in your home.



Benefit
Multizone
operation
without
external
amplifiers.



A-BUS® Technology

With an A-BUS-equipped Harman Kardon AVR and an ABH-4000 hub, any home can easily be divided into four separate entertainment zones, in which local customs and individual musical tastes may prevail. Link in an A-BUS-equipped remote AVR and the possibilities multiply. Whole-house audio systems don't have to be complicated.





Dimmer

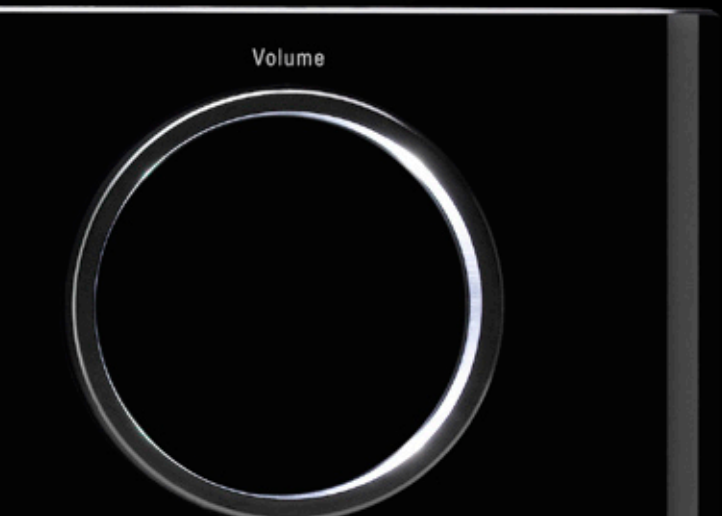
Memory

Select

» 2-Channel sound at its best is like having artists perform live in your living room.

Frank Gaisser | Product Manager Home Solutions, Harman Deutschland

4dB



Stereo Features



Keeping the Audio Faith

The Harman Kardon Festival TA 230, introduced 50 years ago this year, was the world's first stereo receiver. Today, we continue to offer a choice of powerful stereo receivers engineered by and for people who prefer to be entertained with their eyes closed.

We're passionate, to be sure, but we're not zealots. One of our newest receivers features digital audio inputs and Dolby Virtual Speaker technology, among other 21st-century innovations. Time marches on, and Harman Kardon products march with it.

High-Resolution Synchronization Link

To minimize the A/D and D/A conversions that degrade signal quality, the Harman Kardon HK 990 stereo integrated amplifier uses an RJ45 connector and LVDS (Low-Voltage Differential Signaling) drivers/receivers to synchronize the amplifier's data clock with incoming data streams of an HD 990 CD player. The result is a jitter-free connection between the amplifier and the source, making it sound as though playback were originating inside the amplifier itself.

Benefit
Flawless
sonic
resolution.





D/A Conversion

Harman Kardon multimedia players use only the highest grade digital-to-analog converters, with high-definition, wide-bandwidth, low-feedback output circuitry in a pure Class A configuration.

Benefit
Minimal noise
and signal loss.



Benefit
Spacious, richly
detailed sound
other players
cannot duplicate.

RLS Technology

Harman Kardon Real-Time Linear Smoothing conversion technology, introduced in 1992, has been hailed as an efficient, high-performance means of transforming digital signals to high-quality analog. Today's RLS III- and IV-equipped Harman Kardon multimedia players and amplifiers banish noise to a nonaudible frequency with very high jitter rejection.

1992

RLS 1

1996 | 1997

RLS 2

2005

RLS 3

2008

RLS 4



Menu

» Video without audio
is just surveillance.

Jurjen Amsterdam | Brand Director, Harman Kardon Home Solutions

HDMI Connectivity

HDMI cables deliver high-definition A/V signals through a single cable with a bandwidth of up to eight Gbits. It is the connection of choice for all HD applications, and all Harman Kardon products offer it.

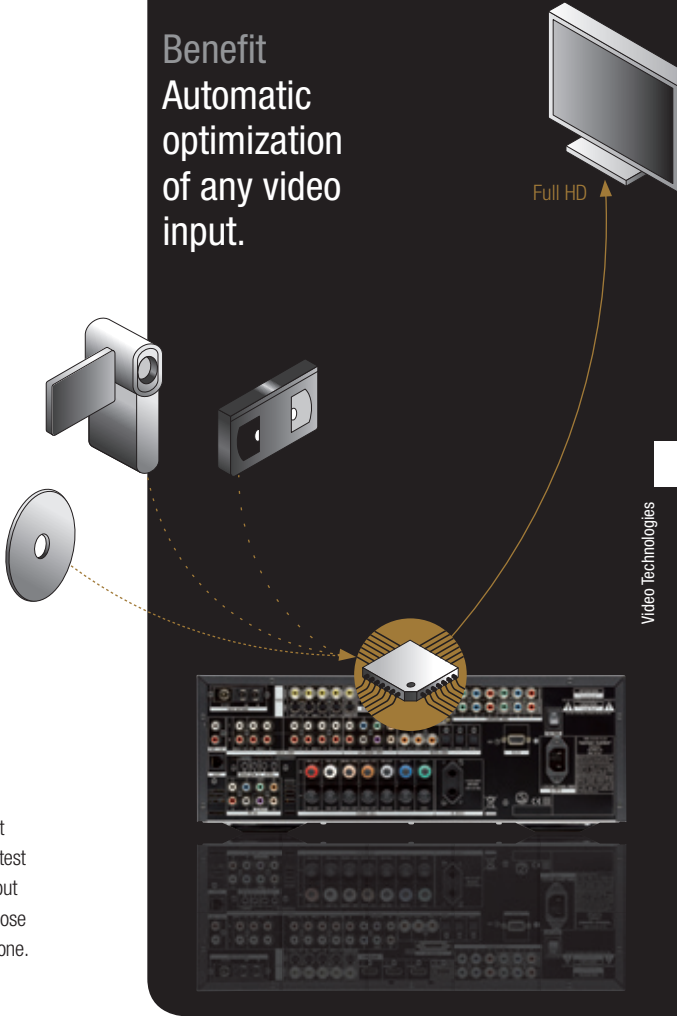


Benefit
Lossless
connectivity
and simple
system setup.

Maximum Video Resolution From Any Source

The rapid advancement of video technology has left a variety of entertainment relics in its wake – tapes and DVDs in various resolutions, aspect ratios from 480i to 1080p, and players and set-top boxes with analog and digital outputs

Benefit
Automatic
optimization
of any video
input.



ranging from RCA plugs to
HDMI. Harman Kardon A/V
receivers are configured not
just to accommodate the latest
formats and technologies, but
also to make the most of those
that are forgotten but not gone.



Faroudja DCDi Cinema™

DCDi Cinema processing, offered on all Harman Kardon 7.1 A/V receivers, uses sophisticated algorithms to improve the image quality of low-resolution NTSC and PAL video signals, removing the jagged edges that are especially noticeable on LCD and plasma flat-panel monitors.

LOGIC 7 5CH CI
SERVER /COAX 4



Benefit
The best-possible picture
from any source.





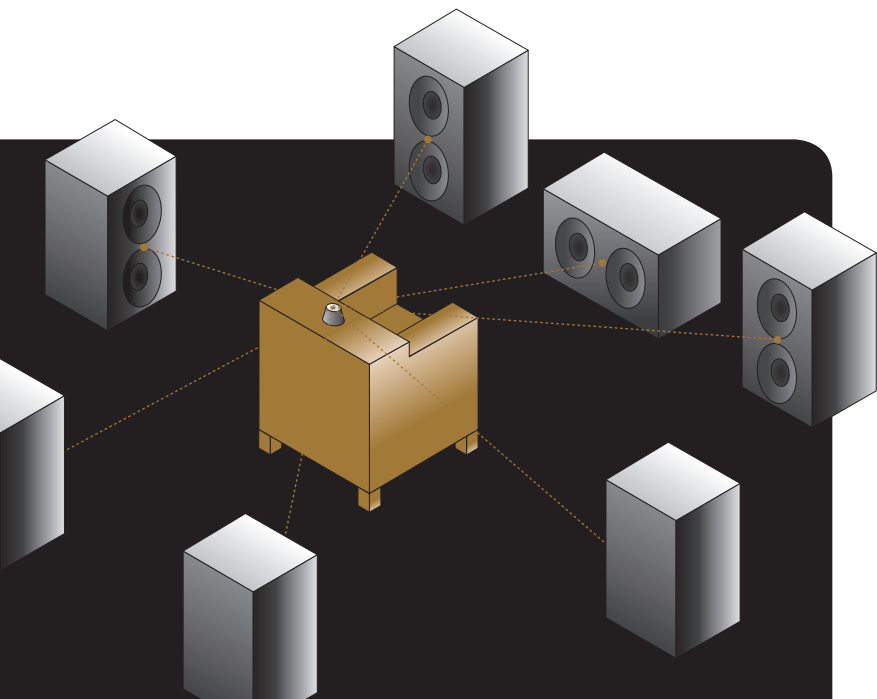
» It should not be difficult
to be entertained.

Richard Metcalfe | Global Brand Director, Harman Kardon

On-Screen Displays (OSD)

Harman Kardon internally developed a new full-color, high-definition OSD with “drop-down” or “scroll” style menu operation. Competition often generates GUI in standard definition (SD) and then scales up to high definition (HD). With the help of a Faroudja® Torino processor, Harman Kardon A/V receivers generate

GUI screens directly in HD, eliminating the need for this extra step of upscaling. The use of the Torino processor also allows for Alpha-blending. With Alpha-blending, the GUI screens can be shown as a transparent overlay over the video input. The OSD is available in 6 different languages.




Benefit
Easy setup and a gentle learning curve with improved appearance.



EzSet/EQ Technology

Calibrating the individual channel levels of a moviehouse sound system has always been a job for trained technicians, but EzSet/EQ speaker calibration systems let users achieve the same results at home. EzSet® uses a built-in sound-pressure measurement to automatically balance speaker-channel levels.

Benefit
Optimum surround sound, regardless of room conditions or speaker type.

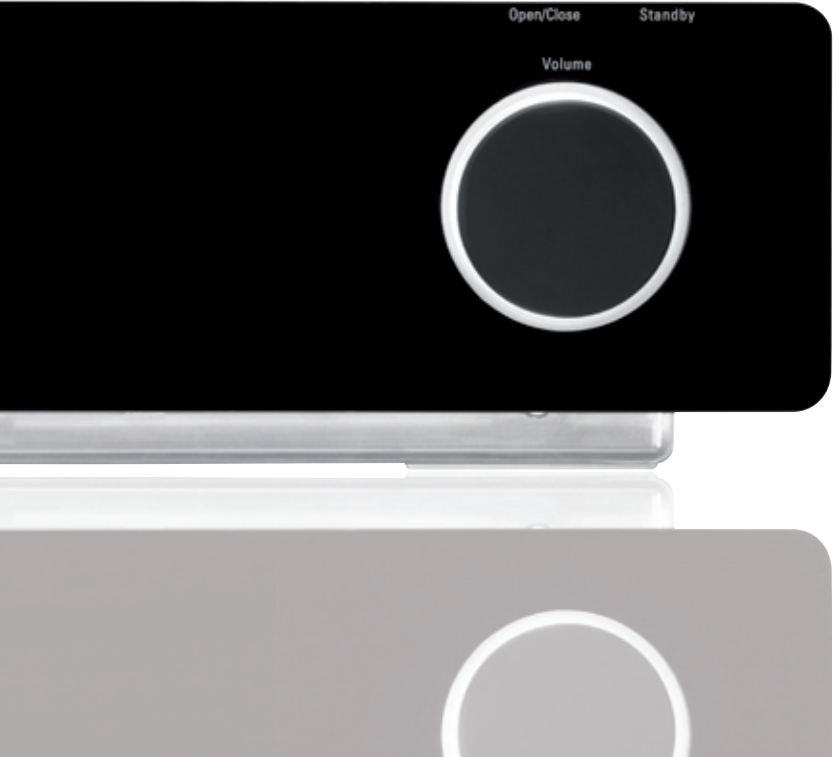


» Harman Kardon design explores the rich fabric of human culture to deliver experiences that define entertainment.

Daniel Ashcraft | Harman Kardon Product Designer, Ashcraft Design

Less Is More

Minimalism has long been a major force in architecture, music and design. It's also been one of our guiding principles from the very beginning. Harman Kardon, Inc. believes that good design consists of essential elements presented in their purest form, with an absence of excess or decoration. Harman Kardon engineers always strive to build products that offer a maximum number of options with a minimum number of buttons and knobs.



Power Consumption

Many of our customers are increasingly aware of environmental issues, and we share their concern. For example, Harman Kardon products offer owners a total power-off option, in addition to standby mode, to reduce unnecessary power usage.



Brand Experience



Premium brands require premium experiences. The value and excitement of the Harman Kardon brand and products should also be reflected in the presentation at retail. Our presentation systems and shop-in-shop solutions ensure that customers will experience all values, features and functions of Harman Kardon products in the best possible way. It is yet another example of the unwavering Harman Kardon commitment to doing things right instead of following trends. We provide in-store audio and video performance, not just bare specifications. Those who truly love entertainment wouldn't want it any other way.



Did You Know?

The Harman Kardon brand is also one of the world's leading suppliers of automotive audio and infotainment systems; our products are found in the premium cars of every major manufacturer.



harman/kardon®
Designed to Entertain.™

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